

CLAIM AMENDMENTS

1 1. (currently amended) A method of making a strained
2 layer on a substrate, the method comprising ~~(1, 2)~~ with the steps
3 of:

4 providing on the substrate in a single epitaxial deposit
5 at least one first epitaxial relaxing layer and on it a second
6 epitaxial layer to be subjected to strain;

7 generating with ion implantation a defect region ~~[(99)]~~
8 in a layer ~~[(1, 2, 4, 6)]~~ neighboring the second layer ~~[(3, 5)]~~
9 to be subjected to strain, and

10 relaxing at least one layer ~~[(4, 6)]~~ neighboring ~~[[to]]~~
11 the second layer ~~[(3, 5)]~~ to ~~[[be]]~~ strain ~~ed to form the~~
12 strained second layer.

1 2. (currently amended) The method according to the
2 ~~preceding claim in which~~ claim 1 wherein dislocations extend from a
3 defect region which give rise to a relaxation of one of the layers
4 ~~[(4, 6)]~~ neighboring the layer ~~[(3, 5)]~~ to be strained.

1 3. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the one
3 layer structure is subjected to at least one thermal treatment
4 ~~[[and/]]~~ or oxidation for relaxation.

1 4. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the
3 defect region ~~[[99]]~~ is produced in the substrate ~~[[1]]~~.

1 5. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein at least
3 one first layer ~~[[6]]~~ is ~~epitactically~~ epitaxially deposited on
4 the layer ~~[[5]]~~ to be strained.

1 6. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 5 wherein the
3 first layer ~~[[6]]~~ has a different degree of dislocation than the
4 second layer ~~(5) to form the strained layer.~~

1 7. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 5 wherein the
3 first layer ~~[[6]]~~ is relaxed.

1 8. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1, further
3 comprising the step of
4 depositing a further layer between the layer ~~[[5]]~~ to
5 be strained and the substrate ~~(1, 2) a further layer (4) is~~
6 disposed.

1 9. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 8 wherein the
3 further layer ~~[[4]]~~ has a different degree of dislocation than
4 the layer ~~[[5]]~~ to be strained.

1 10. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein a
3 plurality of layers ~~[[4, 6]]~~ are relaxed.

1 11. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein a
3 plurality of layers ~~[[3, 5]]~~ to be strained ~~[[,]]~~ are strained.

1 12. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims in which~~ claim 1 wherein an epitactic
3 epitaxial layer structure comprised of a plurality of layers on
4 different substrates ~~[[1, 2, 3, 4, 5, 6]]~~ is made in a single
5 deposition process.

1 13. The method according to ~~one of the preceding claims~~
2 ~~characterized in that~~ claim 1 wherein applied layers are thereafter
3 removed.

1 14. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein at least
3 one strained layer ~~[[5]]~~ is produced on a thin relaxed layer
4 ~~[[4]]~~.

1 15. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that a removal of~~ claim 1,
3 further comprising the step of
4 removing a layer by means of implantation, especially by
5 ~~means of hydrogen or helium implantation is carried out.~~

1 16. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the
3 defect region produced is used as a separating plane.

17. (canceled)

1 18. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein for
3 ~~[[an]]~~ ion implantation, hydrogen ions ~~[[and/]]~~ or helium ions are
4 ~~selected~~ used.

1 19. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein ions
3 with a dose of 3×10^{15} through $4 \times 10^{16} \text{ cm}^{-2}$ are ~~selected~~ used for
4 producing the defect region ~~[[99]]~~.

1 20. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein Si ions
3 are ~~selected~~ used for the implantation.

1 21. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein a dose
3 of 1×10^{13} to $5 \times 10^{14} \text{ cm}^{-2}$ is used to produce the defect region
4 [[(99)]].

1 22. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein for the
3 implantation, hydrogen ions, carbon ions, nitrogen ions, fluorine
4 ions, boron ions, phosphorous ions, arsenic ions, silicon ions,
5 germanium ions, antimony ions, sulfur ions, neon ions, argon ions,
6 krypton ions or xenon ions or an ion type of the layer material
7 itself is used for producing the defect region [[(99)]].

1 23. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1, further
3 comprising the step of
4 effecting a relaxation over a limited region of at least
5 one layer ~~(4, 6)~~ is effective.

1 24. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1, further
3 comprising the step of
4 arranging a mask (66) is arranged on the layers
5 structure.

1 25. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the one
3 layer structure is relaxed only on the implanted region [[and/]] or
4 is stressed.

1 26. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the one
3 layer structure is primarily irradiated with ions.

1 27. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims in which~~ claim 1 wherein hydrogen [[and/]] or
3 helium is implanted to a considerable depth and during a subsequent
4 heat treatment, collects in a defect region and thus enables
5 separation.

1 28. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 27 wherein the
3 dose for the hydrogen [[and/]] or helium implantation can be
4 reduced for the separation.

1 29. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein in the
3 ~~layers structure~~ primarily crystal defect ~~[[and/]]~~ or in the
4 substrate proximal to the ~~epitactic~~ epitaxial layer structure an
5 extended defect region ~~[[99]]~~ is produced.

1 30. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the
3 energy of the implanted ions is so selected that the mean range is
4 greater than the total layer thickness of the ~~epitactic~~ epitaxial
5 layer structure.

1 31. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the
3 thermal treatment is carried out in a temperature range of 550
4 degrees C to 1200 degrees C , ~~especially from 700 degrees C to 950~~
5 ~~degrees C.~~

1 32. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the
3 thermal treatment is carried out in an inert, reducing, nitriding
4 or oxidizing atmosphere.

1 33. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the
3 dislocation density after the growth amounts to less than 10^5 cm^{-2} .

1 34. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein a
3 ~~strained layer (5') and/ or an unstrained layer [(5)]~~ with a
4 surface roughness of less than 1 nanometer are produced.

1 35. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that a~~ claim 1 wherein layers
3 ~~structure~~ comprising silicon, silicon-germanium [(Si-Ge)] or
4 silicon-germanium-carbon [(Si-Ge-C)] or silicon carbide (Si-C) ~~is~~
5 are deposited upon [[a]] the substrate [(1)].

1 36. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that a~~ claim 1 wherein layers
3 ~~structure~~ comprised of a III-V compound semiconductor, ~~especially a~~
4 ~~III-V~~ nitride, a II-VI compound semiconductor or an oxidic
5 perovskite is deposited on the substrate [(1)].

1 37. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein Si-Ge is
3 ~~used as the material for at least one of the layers [(4, 6)]~~ to
4 be relaxed.

1 38. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein two Si-
3 Ge layers [(4, 6)] are relaxed.

1 39. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein at least
3 one layer with an additional carbon content of one to two atomic
4 percent is provided and ~~in which relaxation is carried out~~ is
5 relaxed.

1 40. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein an SOI
3 substrate ~~(1, 2, 3) (silicon on insulator)~~ is ~~selected~~ used.

1 41. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein an Si
3 layer ~~[(3, 5)]~~ with a layer thickness below 200 nanometers is
4 ~~selected~~ used.

1 42. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein silicon,
3 silicon germanium ~~[(Si-Ge)]~~, silicon carbide ~~[(Si-C)]~~, sapphire
4 or an oxidic perovskite or a III-V or II-VI compound semiconductor
5 is ~~selected~~ used as the substrate ~~[(1)]~~.

1 43. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein a wafer
3 bonding is carried out.

4 44. (currently amended) The method according to ~~one of~~
5 ~~the preceding claims characterized in that~~ claim 1 wherein the
6 ~~layers are structure is~~ bonded to a second substrate.

1 45. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein the
3 ~~layers structure is~~ are bonded to ~~[[a]]~~ the substrate with an MIO₂
4 layer.

1 46. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that at lest~~ claim 1 wherein
3 the ~~[[first]]~~ substrate is removed.

1 47. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein on a
3 strained silicon region ~~[[5']]~~ an n- ~~[[and/]]~~ or p- MOSFET is
4 produced.

1 48. (currently amended) The method according to ~~one of~~
2 ~~the preceding claims characterized in that~~ claim 1 wherein on at
3 least a strained silicon germanium ~~[[Si-Ge]]~~ region as a
4 nonrelaxed region of a layer, a p- MOSFET is produced.

49. (canceled)

1 50. (withdrawn) A layer structure comprising a layer
2 (4', 4; 5', 5) on a substrate (1) characterized in that the layer
3 (4', 4; 5', 5) is configured to be in part strained.

1 51. (withdrawn) The layer structure comprising a
2 substrate characterized in that on the substrate (1, 2) a strained
3 region (5') of a layer is located in a plane planar adjacent an
4 unstrained region (5) of this layer.

1 52. (withdrawn) A layer structure according to the
2 preceding claim characterized in that at least a strained region
3 (5') of a layer is disposed on at least one relaxed region (4') of
4 another layer.

1 53. (withdrawn) A layer structure according to the
2 preceding claim characterized in that a strained region (5') of one
3 layer is disposed between two relaxed regions of two further
4 layers.

1 54. (withdrawn) A layer structure according to the
2 preceding claim characterized in that at least a relaxed region
3 (4') is provided in a plane in planar relationship adjacent at
4 least one strained region (4).

1 55. (withdrawn) A component comprising a layer
2 structure in accordance with one of the preceding claims 50 through
3 54.

1 56. (withdrawn) A fully depleted p-MOSFET as the
2 component according to claim 55.

1 57. (withdrawn) A modulated doped field defect
2 transistor (MODFET) or metal oxide semiconductor field effect
3 transistor (MOSFET) as the component according to claim 55.

4 58. (withdrawn) A tunnel diode especially a silicon
5 germanium (Si-Ge) tunnel diode as the component according to claim
6 55.

1 59. (withdrawn) A photodetector as the component
2 according to claim 55.

1 60. (withdrawn) A laser, especially a quantum cascade
2 laser on the basis of Si-Ge, as the component according to claim
3 55.